

ASECAP

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Briefing Report

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ASFA
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THE SPEAKERS



Malika Seddi
ASECAP



Christophe Boutin
ASECAP / ASFA



Emanuela Stocchi
PIARC / AISCAT



Roberto Arditi
SINA



Bill Halkias
New Attica Tollway Concession Co.



Julien Castres Saint Martin
SANEF



Joshua LaRocque
PIARC



Ana Sofia Côrte-Real de Matos Tomaz
ANSR



John Milton
PIARC



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OPENING REMARKS

Malika Seddi, ASECAP Secretary General & CEO

Malika Seddi, Secretary General and CEO of ASECAP, opened the 18th ASECAP Road Safety Conference by warmly welcoming participants to the city of Chambéry. Acting as Master of Ceremony, she expressed her pleasure at hosting the event and greeted the distinguished guests present, including ASECAP President Christophe Boutin, PIARC President Emanuela Stocchi, as well as representatives from the road transport community, institutional stakeholders and industry experts. She highlighted the importance of bringing together such a diverse audience committed to improving road safety and advancing resilient motorway infrastructure. In her introductory remarks, she reminded participants that the ASECAP Road Safety Conference has become a key annual event for the organisation. Now in its eighteenth edition, the conference reflects ASECAP's longstanding commitment to road safety as one of the highest priorities for motorway operators.



She emphasized that the strong participation at this year's event—bringing together more than 120 participants—demonstrated both the continued relevance of the topic and the shared determination of stakeholders across the sector to exchange knowledge, experiences and best practices. Malika Seddi also presented the structure of the day's programme, which began with a high-level institutional panel jointly organised with PIARC, followed by expert sessions dedicated to road safety challenges and solutions. She underlined that the conference theme, "Building and Managing the Resilient Motorways of Tomorrow", reflects the evolving challenges faced by road infrastructure operators in an increasingly complex mobility landscape. Issues such as resilience to extreme weather events, digitalisation, safety management and sustainable infrastructure development require coordinated responses and stronger cooperation between public authorities, infrastructure operators, researchers and industry partners.

Before opening the institutional session, she formally introduced the first speakers of the conference. She invited ASECAP President Christophe Boutin to deliver the opening address, thanking him for his leadership and commitment to strengthening collaboration within the European motorway community. Following his intervention, she welcomed Emanuela Stocchi, President of PIARC and Chair of the ASECAP Road Safety Committee, highlighting the close partnership between ASECAP and the World Road Association and the importance of this cooperation in addressing global road safety challenges.

Malika Seddi then introduced the institutional panel that would open the conference discussions. She welcomed Roberto Arditi, Scientific Coordinator at SINA and a long-standing expert in road safety and intelligent transport systems, who had kindly accepted to moderate the joint PIARC-ASECAP institutional session.

She briefly recalled his extensive experience in the field, including his previous role as Chair within the PIARC Road Safety Committee and his work coordinating the European platform on ITS projects aimed at fostering cooperation and harmonised deployment of intelligent transport systems across Europe.
Concluding her introduction, she invited Roberto Arditi to join her on stage and begin the institutional panel discussion dedicated to the resilience of road infrastructure in the face of catastrophic weather events and its implications for road safety. She encouraged participants to actively engage in the discussions throughout the day, stressing that dialogue and collaboration between all stakeholders remain essential to building safer, more resilient motorway networks for the future.

Christophe Boutin, ASECAP President

Christophe Boutin, President of ASECAP, delivered the opening address of the 18th ASECAP Road Safety Conference by warmly welcoming participants to Chambéry, a city he described as an inspiring setting for discussions on road infrastructure and mobility. He briefly highlighted the historical and cultural significance of the city, located in the heart of the French Alps and known for its rich heritage, picturesque architecture and close proximity to alpine landscapes and lakes. According to him, Chambéry provided an ideal environment for bringing together the international road community to reflect on the future of safe and resilient transport infrastructure. He expressed his satisfaction with the strong participation in this year's conference, noting that more than 120 participants from 28 countries had gathered in person for the event. This broad international representation, he underlined, demonstrates the importance of road safety as a shared priority for the global road community. He also explained that the conference had been scheduled in Chambéry in connection with the 17th World Congress on Road Winter Service, Resilience and Decarbonisation, organised by PIARC, thereby creating an opportunity to bring together experts, policymakers and operators from across the sector. Christophe Boutin highlighted the importance of the institutional session jointly organised by ASECAP and PIARC, which focused on the resilience of road infrastructure in the face of climate-related challenges such as extreme winter conditions, floods and wildfires. As climate hazards increasingly affect transport networks, he emphasized that strengthening infrastructure resilience is essential not only to maintain network performance but also to enhance road safety.

The session aimed to encourage dialogue and the exchange of experience among stakeholders on how infrastructure design, maintenance strategies and operational practices can be adapted to address these evolving risks. In his remarks, he also took the opportunity to acknowledge the close cooperation between ASECAP and PIARC in organising the institutional panel. He warmly thanked PIARC President Emanuela Stocchi for her commitment to strengthening collaboration between the two organisations. He also expressed his appreciation to Patrick Malléjacq, current Secretary General of PIARC, and Miguel Caso Florez, incoming Secretary General, for their support in developing this joint initiative together with ASECAP Secretary General Malika Seddi. He welcomed the presence of the PIARC delegation at the conference, noting that such collaboration illustrates the importance of partnerships between international organisations in addressing complex mobility challenges.
Christophe Boutin then briefly introduced ASECAP to participants who might be less familiar with the organisation. He explained that ASECAP represents toll road operators across 17 European countries, bringing together 133 companies responsible for operating, maintaining and managing more than 82,000 kilometres of motorway infrastructure. He highlighted that these operators work with a long-term vision aimed at ensuring high standards of safety and service quality while also reducing the carbon footprint of road infrastructure and contributing to environmental protection through the user-polluter-payer principle, which provides a sustainable model for infrastructure financing.

He also provided an overview of the economic contribution of the toll road sector. In 2024, motorway operators represented within ASECAP generated annual revenues of approximately €36 billion, while investing around €7.5 billion in infrastructure development and maintenance. In addition, tolling activities generate significant fiscal returns for governments. Value Added Tax alone represented around €6 billion in 2024, meaning that the sector contributed approximately €13.5 billion to public finances, enabling governments to allocate resources to other social priorities.

Turning specifically to road safety, Christophe Boutin reaffirmed that ensuring safe travel conditions is a core mission for ASECAP and its members. He emphasized that motorway operators play a crucial role in maintaining safe and efficient traffic flow, working closely with motorway agents, traffic police and rescue services who intervene daily on the network to protect road users and ensure smooth circulation. While motorways remain the safest category of road infrastructure, he acknowledged that specific safety challenges persist, including accidents caused by fatigue, driver distraction, alcohol consumption and inappropriate speed. He also pointed to the increasing importance of adapting infrastructure to the impacts of climate change. Christophe Boutin highlighted that encouraging progress has nevertheless been achieved on the networks operated by ASECAP members. The fatality rate has decreased from 2.3 fatalities per billion kilometres driven in 2022 to 1.9 in 2023 and further to 1.6 in 2024. These figures indicate steady improvements in motorway safety performance. However, he stressed that further efforts are required, particularly in light of the Vision Zero objective promoted by the European Commission and the United Nations, which aims to eliminate road fatalities in the long term. He noted that recent European statistics show only limited reductions in road fatalities and even increases in some countries, indicating that continued action remains necessary.

Another issue he highlighted was the growing number of incidents involving road workers and motorway personnel operating on the network. He explained that accidents involving staff working on roadsides have increased in recent years, often linked to driver distraction or reduced vigilance, including the use of mobile phones while driving. Ensuring the safety of personnel responsible for maintaining and securing motorway infrastructure is therefore a key priority for motorway operators.

In this context, he announced that ASECAP will launch the fourth edition of its European-wide awareness campaign aimed at protecting road workers. Scheduled for 25 June, the campaign titled “S(h)e Works, I Care” seeks to raise awareness among drivers about the importance of protecting road staff working on motorway networks. The initiative includes activities at motorway service areas and has gradually expanded from an initial pilot within one ASECAP member country to become a coordinated annual campaign across several European motorway networks.

He encouraged participants and organisations present at the conference to join the initiative and contribute to promoting safer behaviour among road users.

In conclusion, Christophe Boutin thanked the members of COPER II—the ASECAP permanent committee dedicated to road safety and sustainability—as well as the ASECAP Secretariat for their work in preparing the conference programme. He expressed his appreciation to all participants for attending the event and contributing to discussions on improving road safety. Finally, he invited participants to continue engaging with ASECAP’s activities and announced the organisation’s next major event, the 53rd ASECAP Study and Information Days, which will be hosted by NDS in Bratislava from 27 to 29 May 2026.



Emanuela Stocchi, COPER 2 Chair – PIARC President

Emanuela Stocchi opened her intervention by expressing her pleasure and emotion at participating in the ASECAP Road Safety Conference in Chambéry. She underlined that the event was particularly meaningful for her, as she feels closely connected to both professional communities represented at the conference. Indeed, as President of the World Road Association (PIARC) and Chair of COPER II within ASECAP, she highlighted her strong engagement with both organizations and emphasized the natural convergence between their respective missions. In her remarks, she stressed that ASECAP and PIARC share more than a conference stage; they share a common mission centred on the advancement of road infrastructure, innovation, safety and sustainable mobility.



Road safety, she underlined, is a global and shared responsibility that requires the commitment of all actors involved in the road transport ecosystem. She explained that PIARC brings together the global public-sector road community, with representatives from 128 countries, including administrations, technical experts, researchers and practitioners who contribute to the development of knowledge and best practices worldwide. In contrast, ASECAP represents motorway operators and concessionaires responsible for ensuring that infrastructure operates efficiently, safely and sustainably on a daily basis. According to her, these two perspectives are complementary and represent essential dimensions of the broader mobility system.

Emanuela Stocchi further explained that the challenges currently facing the road sector—such as climate adaptation, decarbonisation, digitalisation, resilience and the financing of sustainable infrastructure—cannot be addressed in isolation or through fragmented approaches. These complex issues require cooperation and structured dialogue between policymakers, regulators, infrastructure operators, engineers and industry stakeholders. She noted that events such as the ASECAP Road Safety Conference provide an ideal platform for fostering such exchanges and strengthening collaboration between the different actors involved in the sector. She also referred to recent discussions held during the PIARC Executive Committee meetings that had taken place over the preceding weekend. During these meetings, one of the key topics on the agenda had been the strengthening of global partnerships with organizations active in the road and transport sector.

She indicated that cooperation with ASECAP represents a concrete example of this strategy in action, demonstrating how international organizations can work together to address common challenges and share expertise across institutional and operational boundaries. Highlighting the historical mission of PIARC, she recalled that the organization has been dedicated for more than a century to facilitating the exchange of technical knowledge and best practices among road professionals worldwide. Through its technical committees and working groups, PIARC develops guidance and promotes innovation in areas such as asset management, resilient infrastructure design and low-carbon construction methods. She pointed out that many of the topics addressed during the conference sessions—including asset management, resilience and sustainable infrastructure—are directly aligned with the work carried out within PIARC's technical communities.

At the same time, she emphasized that the operational expertise of toll road operators represented by ASECAP provides invaluable insights into how policies and technical recommendations are implemented in real-world operational environments.

In this context, she encouraged ASECAP members and conference participants to actively engage with PIARC's activities. She invited them to contribute to the organization's technical committees, participate in calls for papers, and share operational case studies that could enrich the global knowledge base of the road community. She also took the opportunity to highlight upcoming international events organized by PIARC, including the 17th Winter Road Congress on Winter Service, Resilience and Decarbonisation, as well as the next World Road Congress scheduled to take place in Vancouver, Canada, in October 2027. These events, she explained, represent key opportunities for knowledge exchange and collaboration within the international road community.

Concluding her intervention, Emanuela Stocchi emphasized that the strength of the global road community lies in its capacity for inclusion and collaboration. She noted that when organizations such as PIARC and ASECAP work together, they contribute to strengthening the entire mobility ecosystem and enhancing the sector's ability to respond to emerging challenges. Observing the presence of several representatives of the international road community in the audience—including members of the PIARC Executive Committee and representatives from different countries—she highlighted that their participation illustrated the value of this collaborative spirit. She concluded by thanking participants for their continued commitment to excellence in road infrastructure and by expressing her confidence that the partnership between PIARC and ASECAP will continue to develop constructively in the years ahead.



INSTITUTIONAL SESSION (JOINT SESSION PIARC/ASECAP)

Moderator: Roberto Arditi — Scientific Coordinator, SINA, Italy

Roberto Arditi, representing SINA and acting as moderator of the session, opened the institutional discussion by warmly welcoming the distinguished delegates, colleagues, and participants. He expressed his appreciation for being part of the 18th ASECAP Road Safety Conference and underlined the significance of the event, highlighting its success and the positive outcomes already observed. He emphasized that such a high-level congress provides a unique opportunity to address key challenges and share progress in improving road safety. He then set the context for the session, noting that the discussion takes place at a particularly critical time for road infrastructure operators. According to him, the challenges affecting road networks are becoming increasingly complex, systemic, and urgent. He stressed that climate change and extreme weather events are no longer distant or hypothetical risks, but rather a daily operational reality. Phenomena such as wildfires, heatwaves, and severe weather events are placing unprecedented pressure not only on infrastructure but also on the safety of road users and operational staff.





Roberto Arditi explained that the theme of the session—focused on the resilience of infrastructure in the face of catastrophic events—aims to address a crucial and dimensional question. He highlighted that ensuring road safety under increasingly difficult and unpredictable conditions is not only a technical issue but also a strategic, institutional, and societal challenge. In his view, resilience should not be limited to infrastructure design or engineering solutions, but must encompass a broader approach involving preparedness, coordination, and adaptability.

He also emphasized the high-level and international nature of the panel, bringing together representatives from various countries, including Greece, France, Canada, Portugal, the United States, and Kazakhstan. These speakers, coming from diverse backgrounds such as research institutions, operators, authorities, and policymaking bodies, were expected to provide complementary perspectives on the topic.

At the core of the session, Roberto Arditi introduced a fundamental guiding question for the discussion: how to ensure continuity of service while simultaneously protecting human lives in the context of increasingly frequent extreme weather events. He expressed confidence that, despite the diversity of national contexts and experiences, common conclusions and shared solutions could emerge from the exchange.

He then outlined the format of the session, which was deliberately designed to be interactive and dynamic. The discussion would begin with an introductory intervention aimed at framing the debate, followed by a combination of short, focused contributions and a roundtable discussion. He encouraged all speakers to actively engage with one another, react to previous interventions, and foster a genuine exchange of ideas. Time allocations were clearly defined, with five minutes for initial remarks and three minutes for follow-up contributions.

In his concluding remarks, Roberto Arditi summarized the key message of the session through a concise and impactful statement. He stressed that while extreme weather events are inevitable and will not disappear, their consequences on road safety can—and must—be mitigated. He underlined that this represents a critical window of opportunity for stakeholders to collaborate, innovate, and take action collectively.
He then officially opened the discussion by introducing the first speaker, marking the transition from the introductory remarks to the substantive exchanges of the session.

Bill Halkias, CEO, New Attica Tollway Concession Co., Greece - Turning winter Crisis in Greece into Knowledge - Lessons Learned

Bill Halkias, CEO of New Attica Tollway Concession Co. in Greece, delivered a keynote speech focusing on the lessons learned from the severe winter crisis that struck Athens in January 2022. His intervention provided a candid and experience-based account of the operational, institutional, and strategic challenges faced during this unprecedented event, as well as the key takeaways for improving resilience and crisis management in the future. He began by contextualizing the Attica Tollway, a major ring road infrastructure around Athens, originally constructed on Concession basis and operated in stages starting from March 2001 and fully operational in June 2004, ready for the August 2004 Olympic Games. The initial Concession ended in October 2024 and was renewed under a new 25-year concession agreement to a new GEK-TERNA Concessionaire Company. While snowstorms are relatively rare in Athens, he stressed that when they do occur, they can be particularly intense and disruptive.



He illustrated this point by referring to several past snow events, notably in 2004, 2008, and 2021, before focusing on the January 2022 storm, which proved to be fundamentally different due to the rapid accumulation of approximately 20 centimeters of snow within just 12 hours.
Bill Halkias explained that this event, named “Elpida,” (which translates into ‘Hope!’) was forecast in advance, allowing for preparatory meetings to take place. However, he highlighted critical shortcomings in the coordination process. The newly established Ministry of Climate Crisis and Civil Protection assumed a central coordination role, but key stakeholders were not adequately involved in the preparatory discussions.

In particular, traffic police and infrastructure authorities were absent, and tollway operators were insufficiently integrated into the decision-making process. As a result, important preventive measures —such as the early banning of heavy vehicles— were proposed by operators but ultimately not implemented on the basis of “wait-and-see approach at the time”. He then described how the situation unfolded on the day of the event. Despite forecasts, the day began with clear weather, leading to normal traffic conditions as citizens proceeded with their daily routines. When the snowstorm began late in the morning, traffic volumes were already high.

Compounding the situation, authorities closed the key national road just north of the tollway, diverting heavy traffic—including trucks from major logistics hubs—onto the Attica Tollway. At the same time, a decision was made to shut down public services, prompting a mass departure of commuters attempting to return home simultaneously.
A series of critical decisions further aggravated the crisis. The suburban rail system, which runs in the central median strip and could have supported evacuation efforts, was shut down. The delayed imposition of restrictions on heavy vehicles resulted in multiple incidents of jackknifed trucks, which quickly blocked the motorway.

Within hours, the situation escalated dramatically: sections of the tollway were progressively closed, and eventually, the entire road network became immobilized, leaving approximately 3,500 vehicles stranded.

Bill Halkias emphasized that the consequences were severe, requiring emergency intervention by civil protection authorities and eventually the army to evacuate stranded motorists. The event marked the first complete closure of the Attica Tollway in its 21-year history. Beyond the operational crisis, the situation quickly evolved into a political and public controversy, with intense media criticism directed at the tollway operator. He noted that despite years of reliable service, the company faced strong accusations regarding its handling of the crisis, including questions about why the motorway had not been closed earlier.
Addressing this criticism, he presented a counterfactual analysis conducted by the operator. According to their traffic modelling, an earlier closure of the tollway would have displaced up to 30,000 vehicles onto local roads, which lacked the capacity and resources to remain operational under such extreme conditions. This, he suggested, could have resulted in an even more severe and widespread disruption. Reflecting on the lessons learned, Bill Halkias provided a frank assessment of both institutional and operational shortcomings. He stressed the importance of clear leadership, strong coordination among all stakeholders, and the need for operators to assert their expertise in critical situations. He acknowledged that one of the key mistakes was the failure to firmly insist on operational decisions, particularly regarding preventive traffic restrictions. He also highlighted the lack of communication with the public, noting that stronger and earlier messaging could have reduced unnecessary travel and mitigated the scale of the crisis.
He further emphasized that crisis management requires a unified and coherent approach across all agencies, including transport operators, public authorities, and emergency services. The absence of coordination—illustrated by the simultaneous closure of the suburban rail system—demonstrated the consequences of fragmented decision-making. In response to the crisis, he noted that new crisis management plans have since been developed, with a stronger focus on integrated command structures and preparedness.

In his concluding remarks, Bill Halkias framed resilience as an ongoing learning process in the context of climate change. He described a continuous cycle of exposure, vulnerability assessment, adaptation, and improvement. Above all, he stressed that human life and safety must take precedence over all other considerations, including contractual obligations. He argued that operators must not hesitate to take decisive actions such as closing a motorway—when necessary to protect users, even if such decisions carry operational or legal implications.

His intervention offered a powerful and transparent reflection on a major crisis, highlighting both the complexity of managing extreme events and the critical importance of coordination, anticipation, and decisive leadership in ensuring road safety.

Julien Castres Saint Martin, Infrastructure Director, Groupe Sanef, France

Julien Castres Saint Martin, Infrastructure Director at Groupe Sanef (France), delivered an intervention focusing on the challenges of adapting motorway infrastructure to increasing flood risks and changing environmental conditions. His presentation provided an insightful overview of how climate change, aging infrastructure, and evolving land use patterns are reshaping the approach to resilience in motorway operations.

He began by briefly introducing Groupe Sanef, highlighting its role as a major motorway operator in France. The company manages approximately 1,800 kilometers of highways in the northern part of the country, representing around 20% of the French motorway network, and employs about 2,000 people. As part of the Abertis Group, Sanef contributes to a broader European network of approximately 8,000 kilometers. He emphasized the diversity of the network, which includes infrastructure of varying ages, with some structures dating back more than 60 years—an important factor in understanding current vulnerabilities.

Focusing on the specific challenges faced in France, Julien Castres Saint Martin identified water—particularly in its liquid form—as the primary threat to motorway infrastructure. Unlike snow-related crises discussed in other contexts, he explained that in France, the main risks stem from intense rainfall events leading to flooding, landslides, and rockfalls. He chose to concentrate primarily on flooding, which has become increasingly frequent and severe in recent years. He described a significant shift that has occurred over the past decade. Historically, motorway infrastructure and its users were well protected thanks to conservative design standards and high construction quality, particularly during the major development phases of the 1960s to 1980s.



These design principles provided strong safety margins that ensured resilience. However, he stressed that these traditional approaches are no longer sufficient in the face of evolving climatic conditions.

According to him, two major factors explain this change. First, the intensity and frequency of weather events have increased, exposing infrastructure to conditions for which it was not originally designed. Second, and equally important, the surrounding environment has significantly evolved. He illustrated this with examples where natural floodplains or water expansion areas had been progressively urbanized or altered, leading to increased water flow towards motorway infrastructure.

In some cases, external infrastructure—such as inadequately sized hydraulic systems managed by nearby cities—has contributed to prolonged flooding on motorways, demonstrating the interdependence between transport infrastructure and its environment. Julien Castres Saint Martin emphasized that resilience can no longer rely solely on initial design. Instead, operators must actively maintain and enhance existing safety margins. He detailed the operational measures implemented by Sanef, including regular inspection of bridges (including underwater inspections), systematic cleaning and monitoring of drainage systems, and continuous maintenance of hydraulic infrastructure.

Where possible, improvements are also introduced, such as increasing drainage capacity or creating additional buffer zones to better manage excess water.
Another key pillar of resilience, he noted, is preparedness. Unlike some other types of crises, weather-related events can generally be predicted with reasonable accuracy. This provides an opportunity for operators to anticipate disruptions and prepare accordingly. He highlighted the importance of maintaining operational readiness through well-defined procedures, staff training, and simulation exercises. He also stressed the need for coordination with local authorities to ensure that all stakeholders are aligned and prepared to respond effectively.
Moving beyond maintenance and preparedness, he addressed the increasing complexity of adaptation projects. He presented a concrete example from northern France, where a motorway built on an elevated embankment was threatened by heavy rainfall, while nearby villages—located downstream—were also experiencing flooding. In this case, measures to protect the motorway, such as increasing water flow capacity, risked exacerbating flooding in surrounding communities. This highlighted the need for integrated solutions that balance the protection of infrastructure with the safety and well-being of local populations.

In his conclusion, Julien Castres Saint Martin underlined that adapting infrastructure to climate change requires significant investment, updated design standards, and extensive collaboration with a wide range of stakeholders, including local authorities, water management agencies, and community representatives. He emphasized that catastrophic events are fundamentally transforming the way infrastructure is designed, operated, and maintained. At the same time, they are creating opportunities to develop more holistic and locally beneficial adaptation projects.

His intervention clearly demonstrated that resilience is no longer a purely technical matter, but a complex, systemic challenge requiring coordination, long-term vision, and shared responsibility among all actors involved.

Joshua LaRocque, PIARC Executive Committee & PIARC First Delegate, Canada

Joshua LaRocque, member of the PIARC Executive Committee and PIARC First Delegate for Canada, delivered a comprehensive intervention highlighting how the intersection of community engagement, climate adaptation, and cultural considerations can enhance infrastructure resilience across highly diverse environments. His presentation provided a broad overview of the Canadian context, emphasizing both the scale and complexity of the country's infrastructure challenges. He began by outlining the central message of his intervention: that effective cooperation emerges when community, climate, and culture are considered together. According to him, this integrated approach is essential in a country like Canada, where geographic and climatic diversity is particularly pronounced. He stressed that Canada faces a wide range of extreme conditions, from snowstorms and coastal erosion to rapidly accelerating warming trends, making it necessary to adopt flexible and context-specific solutions. To illustrate this diversity, Joshua LaRocque first focused on the northern territories, particularly the Yukon region. He described the vast scale of these areas, noting their extremely low population density and the logistical challenges associated with maintaining infrastructure in such remote environments. In these regions, traditional monitoring methods are insufficient due to the lack of human presence. As a result, innovative technologies such as drones and unmanned aerial systems are used to detect ground movements and monitor the degradation of permafrost.

These tools enable early identification of vulnerabilities and allow operators to intervene proactively, especially given the limited time windows available for transporting construction materials to these remote areas. He further highlighted the diversity of Canadian ecosystems by referencing the presence of the Carcross Desert in Yukon—one of the smallest deserts in the world—within a broader Arctic context. This example illustrated the necessity of adapting infrastructure design, materials, and operational approaches to highly variable environmental conditions, sometimes even within a single project. He emphasized that engineering solutions must be flexible and responsive to local ecosystems, while also integrating input from communities, particularly in areas where conventional reporting mechanisms are limited.

Joshua LaRocque then shifted focus to Alberta, where he addressed the issue of wildlife collisions, identified as a major safety concern in Canada. He presented the example of the Bow Valley Gap wildlife overpass, a project developed through collaboration between Indigenous communities, provincial and federal authorities, and technical experts. This infrastructure not only improves road safety for motorists but also supports wildlife movement by guiding animals such as moose and caribou across highways using carefully designed natural corridors. He emphasized that this approach represents a shift from solely influencing human behavior to also shaping animal behavior, thereby achieving a more holistic and sustainable safety outcome.



Another example was provided from Vancouver, British Columbia, where heavy rainfall and extreme weather events—such as atmospheric rivers—pose significant risks to infrastructure. He described a community-driven project involving a “rainway” system designed to manage stormwater effectively while maintaining usability for local residents. This solution integrates green infrastructure with traditional drainage systems, demonstrating how community-led initiatives can contribute to resilient and multifunctional infrastructure. He noted that such projects highlight the value of collaboration between citizens, experts, and local authorities in developing innovative and accepted solutions. Throughout his intervention, Joshua LaRocque emphasized the importance of data, innovation, and interdisciplinary collaboration. He underlined the role of advanced technologies, such as LiDAR and aerial monitoring systems, in supporting decision-making processes and improving infrastructure management in challenging environments.

At the same time, he stressed that technical solutions alone are not sufficient; meaningful engagement with communities—including Indigenous populations—is essential to ensure that infrastructure projects are both effective and socially accepted.

In his concluding remarks, he reaffirmed that the increasing complexity of climate-related challenges requires a shift towards more integrated and adaptive approaches. By combining technical expertise, local knowledge, and collaborative governance, infrastructure operators can better anticipate risks, enhance resilience, and ultimately improve safety outcomes across diverse and evolving environments.

His intervention clearly demonstrated that resilience in the Canadian context is not only a matter of engineering, but also of cooperation, cultural understanding, and innovation, offering valuable lessons for infrastructure operators worldwide.

Ana Sofia Côrte-Real de Matos Tomaz, Road Safety Expert, Former Vice-President of the Portuguese National Road Safety Authority (ANSR)

Ana Sofia Côrte-Real de Matos Tomaz, Road Safety Expert and former Vice-President of the Portuguese National Road Safety Authority (ANSR), delivered a compelling intervention focused on the integration of the Vision Zero philosophy and the Safe System approach into climate-resilient road infrastructure. Her contribution highlighted the critical need to bridge the gap between road safety principles and the increasing challenges posed by extreme weather events. She began by expressing her appreciation to ASECAP and the organizers, before introducing the conceptual framework guiding her intervention. She recalled the fundamental principles of Vision Zero and the Safe System approach, emphasizing first that human error is inevitable and that transport systems must be designed to ensure that such errors do not result in fatal consequences. Secondly, she stressed that road safety is a shared responsibility involving all actors, including those who design, build, maintain, operate, and regulate infrastructure. Finally, she underlined that safety must always take precedence over mobility and efficiency, particularly in critical situations. Ana Sofia Côrte-Real de Matos Tomaz explained that these principles become even more relevant during extreme events, such as wildfires, floods, or intense rainfall.

In such situations, uncertainty increases, visibility decreases, infrastructure may degrade, and users are placed under significant stress. These conditions lead to a higher likelihood of human error and increased vulnerability. She highlighted that in these contexts, the Safe System approach requires a proportional increase in system responsibility to compensate for human limitations and ensure safety. To illustrate these challenges, she presented the case of the devastating wildfires that occurred in Portugal in 2017, the deadliest in the country's history. The fires resulted in 117 fatalities, including 66 in the Pedrógão Grande region alone, with 47 deaths occurring on or near a single road.



Many victims were attempting to escape the flames, and a significant number died inside their vehicles, trapped by rapidly advancing fire. She emphasized that this tragedy should not be interpreted as a result of individual behavioral failures, but rather as a systemic failure. The road network, which should have provided safety and connectivity, instead became an exposed and deadly corridor. She pointed out that several critical elements were missing at the time, including risk mapping to identify high-exposure corridors, early closure protocols, and effective traffic management measures to prevent users from entering dangerous areas. The lack of timely and coordinated action significantly contributed to the severity of the consequences.

This led to the establishment of a dedicated committee to analyze the causes of the disaster and identify lessons learned. Building on this experience, Ana Sofia Côrte-Real de Matos Tomaz outlined a series of recommendations structured around the phases of before, during, and after extreme events. In the preparation phase, she emphasized the importance of conducting comprehensive risk mapping to identify vulnerable areas and implementing automated road closure and diversion protocols. She also highlighted the need to strengthen coordination and communication among all stakeholders, including civil protection authorities, road operators, and law enforcement agencies.

Public awareness campaigns were identified as another essential tool, as informed users are better equipped to respond appropriately during crises. She further stressed the importance of improving infrastructure resilience through the use of more robust materials, including fire-resistant solutions, and by updating design standards, particularly in areas such as drainage and structural performance. These measures, she explained, are crucial to ensuring that infrastructure can better withstand extreme conditions and support safer operations.

In the response phase, she underscored that reliance on individual decision-making should be minimized. Instead, systems should be designed to guide and protect users through proactive measures, reducing exposure to danger and enabling earlier intervention.

Finally, in the post-event phase, she emphasized the importance of learning and continuous improvement. She advocated for systematic post-event audits to assess what worked and what failed, ensuring that lessons learned are effectively integrated into future planning and operations. The ultimate objective, she reiterated, is to continuously reduce the number and severity of casualties, in line with the Vision Zero ambition of eliminating fatalities.

In her conclusion, Ana Sofia Côrte-Real de Matos Tomaz reaffirmed that integrating road safety principles into climate resilience strategies is essential to addressing the growing risks associated with extreme weather events. Her intervention clearly demonstrated that a systemic, proactive, and coordinated approach is necessary to protect human life and ensure the safe functioning of transport infrastructure under increasingly challenging conditions.

John Milton, Chair of PIARC Road Safety Committee, TC3.1, USA

John Milton, Chair of the PIARC Road Safety Committee (TC3.1, USA), provided a comprehensive intervention focusing on the importance of preparedness, risk assessment, and system resilience in the face of increasingly frequent and severe climate-related events in the United States. His contribution highlighted both strategic planning approaches and practical operational responses developed within his state.

He began by emphasizing the immediacy and relevance of the topic, noting that even during the session, multiple U.S. states were under emergency alerts due to tornadoes. This, he explained, illustrates the constant exposure of the United States to extreme weather events and reinforces the critical importance of preparedness and situational awareness in infrastructure management. John Milton then provided an overview of the climatic conditions affecting his region, characterized by the convergence of contrasting weather systems. Cold Arctic air masses and warmer tropical influences combine to create phenomena such as polar vortex events, resulting in highly variable and often extreme conditions. This climatic diversity is further compounded by the geographical variety within the state, which includes coastal areas, mountainous regions prone to landslides, forested zones, and even desert environments. Such diversity, he explained, significantly complicates infrastructure planning and risk management. A central element of his intervention was the development and implementation of risk mapping as a foundational tool. He explained that his department initiated comprehensive risk assessments to understand how climate impacts vary across different regions and infrastructure types. These assessments considered not only the vulnerability of individual assets but also their role within the broader transport system. For example, the failure of a bridge was analyzed not only in terms of its direct function but also in terms of its systemic impact on network connectivity and resilience.

Building on this approach, a second level of analysis was introduced to evaluate the resilience of the overall network. This included examining alternative transport options, such as rail services, and identifying critical gaps in connectivity—particularly in regions with limited east-west mobility. He stressed that understanding these interdependencies is essential for ensuring continuity of service during disruptions.

John Milton also described specific operational programs designed to mitigate risks, including a risk-based slope stability program. This initiative assesses the likelihood and potential consequences of slope failures, combining safety and mobility criteria to prioritize interventions. Practical measures, such as rock scaling operations carried out by specialized teams, were presented as essential actions to reduce immediate hazards and maintain safe road conditions.

In addition to preventive measures, he highlighted the importance of rapid response capabilities. His department has established a multi-level emergency response system, allowing for quick mobilization of personnel and resources in the event of localized or statewide incidents. This system includes centralized coordination, pre-arranged contracts, and clearly defined procedures, enabling authorities to act swiftly and efficiently when extreme events occur. He illustrated these capabilities through examples of recent events, including severe storms that caused significant infrastructure damage and required the closure of major road sections. In such situations, ensuring public safety becomes a major challenge, particularly as road users may ignore closure signs and attempt to access hazardous areas.



He noted that managing user behavior is an ongoing difficulty, adding complexity to crisis response efforts. Wildfire events were also identified as a growing concern, particularly in regions combining forested and arid landscapes. These events can lead to prolonged road closures and require coordinated responses involving multiple agencies, including natural resource departments. Once again, prior risk assessments and established partnerships proved critical in enabling effective intervention and recovery. Looking ahead, John Milton outlined future challenges, including population growth and increasing demand on infrastructure systems. He emphasized that resilience planning must evolve to address not only climate-related risks but also broader pressures such as urban expansion and major international events.

He stressed the need for holistic and integrated planning approaches that consider both infrastructure assets and the wider network. In his conclusion, he reiterated the importance of collaboration, preparedness, and proactive planning. He emphasized that effective resilience requires strong partnerships, clear contractual frameworks, and a thorough understanding of system vulnerabilities. Risk mapping, in particular, was identified as a critical tool—not only for individual assets but also for the entire transport network, including maintenance facilities and operational capacities. His intervention highlighted that building resilient infrastructure systems in the United States relies on a combination of strategic foresight, operational readiness, and coordinated action among multiple stakeholders, all aimed at ensuring safety and continuity in an increasingly uncertain climate context.

Yerkezhan Amirkhanova, Executive Director, JSC “Kazakhstan Road Institute, Kazakhstan

Yerkezhan Amirkhanova, Executive Director of JSC “Kazakhstan Road Institute”, delivered an informative presentation outlining Kazakhstan’s approach to managing extreme climatic conditions and enhancing road safety through standardization, innovation, and digitalization. Her intervention highlighted the specific challenges associated with operating a vast road network in a highly continental climate and the measures implemented to address them. She began by describing the geographical and climatic context of Kazakhstan, emphasizing the country’s large size and extreme temperature variations. With winter temperatures dropping to as low as -51°C and summer temperatures reaching up to +49°C, the country experiences one of the widest temperature ranges globally. These extreme conditions significantly impact road safety and operational capacity, particularly during winter, when severe frost, blizzards, ice formation, and snow drifts are frequent. Given the scale of the national road network—approximately 25,000 kilometers—Yerkezhan Amirkhanova stressed the importance of implementing unified standards across all regions.

In 2024, Kazakhstan introduced new national regulations for winter maintenance, defining requirements in terms of personnel, materials, and operational resources. These standards are now being actively implemented, with the Kazakhstan Road Institute playing a key role in supporting their application and ensuring consistency across the network. A particular focus of her presentation was on the selection of materials for winter road treatment. While sodium chloride is widely used internationally, its application is restricted in Kazakhstan due to environmental regulations, particularly in urban areas. In response, the Kazakhstan Road Institute developed an alternative solution, referred to as “Eco Smart Anti-Ice” reagents.



These materials do not contain sodium chloride and are designed to improve ice-breaking efficiency while reducing environmental impact and minimizing re-freezing risks. Beyond materials, she highlighted the importance of comprehensive risk management strategies. Kazakhstan has implemented a range of technologies to improve road safety during adverse weather conditions. These include variable message signs (VMS) to provide real-time information to drivers, laser-based guidance systems to assist navigation during low visibility conditions, and snow protection systems installed in areas prone to snow drifts. She noted that ongoing research is being conducted to optimize these protective systems and adapt them to regional needs, as climatic conditions vary significantly between northern and southern parts of the country.

In addition to winter hazards, Yerkezhan Amirkhanova addressed the growing issue of flooding, which results from rapid snowmelt due to sudden temperature increases. To mitigate this risk, Kazakhstan has implemented several infrastructure measures, including protective dikes, reinforced embankments, improved drainage systems, upgraded culverts, and enhanced riverbank protection. These measures are complemented by continuous monitoring and a high level of operational readiness. A key element of Kazakhstan’s strategy is the integration of digital technologies. She presented newly developed systems that combine data from national meteorological services, satellite observations, and international flood monitoring platforms.

These tools enable authorities to identify high-risk areas in advance and take preventive action, such as pre-positioning equipment and mobilizing response teams. Additionally, she introduced “KazRoadMap,” a digital platform that integrates weather data with terrain models to support decision-making for road operators and infrastructure managers.

In her concluding remarks, Yerkezhan Amirkhanova emphasized the importance of collaboration between researchers, policymakers, and operational stakeholders. She underlined that effective road safety and infrastructure management depend on strong cooperation and knowledge-sharing across all levels. Her intervention demonstrated that combining standardized practices, innovative materials, advanced technologies, and institutional collaboration is essential to addressing the complex challenges posed by extreme climatic conditions in Kazakhstan.

Her presentation provided a clear example of how a country facing severe environmental constraints can develop integrated and forward-looking strategies to enhance resilience and ensure the safety of its road network.

To further explore the topics discussed during the conference and revisit key moments, all technical session presentations, along with the event photo gallery, are available on the ASECAP website:

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Below, discover the moderators of the three technical sessions:

TECHNICAL SESSION 1



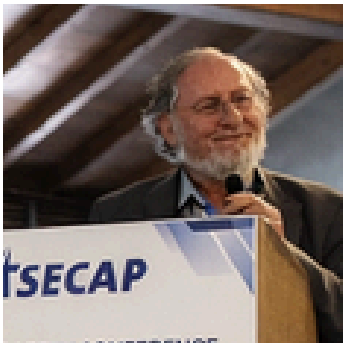
David Kollenhofer
ASFINAG, Austria

TECHNICAL SESSION 2



Bruno de la Fuente
SEOPAN, Spain

TECHNICAL SESSION 3



Bernard Jacob
Université Gustave Eiffel, France



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